hypothesis of homogeneity. Mountainous excrescences, so far from weakening the general stability, really conduce to it; they are not only held up by the tenacity of the neighbouring parts, but, as Airy suggested, they probably have roots which plunge down into material of greater density and permit them to float.

The authors affirm, in conclusion, that their detailed study of the moon appears to them to confirm geologists in their preference for the theory of a thin crust and to indicate that the transition to solidity, still incomplete for the moon, is far from having reached its end upon the earth. ARCH. GEIKIE.

NOTES.

WE regret to announce that Prof. G. B. Howes, F.R.S., died on Saturday last, February 4, at fifty-one years of age.

IT is proposed to erect a monument at Laibach, in Austria, to the memory of Vega, author of the well-known table of logarithms, which is now in its eightieth edition.

FROM the American Mathematical *Bulletin* for January we learn of the death of Dr. Francesco Chizzoni, professor of geometry at Modena, and of Prof. Achsah M. Ely (Miss Ely), head of the department of mathematics at Vassar College, U.S.A.

THE Wilde medal of the Manchester Literary and Philosophical Society has been awarded to Prof. C. Lapworth, F.R.S. The medal will be presented on February 28, when the Wilde lecture of the society will be delivered by Dr. D. H. Scott, F.R.S., on "The Early History of Seed-bearing Plants, as recorded in the Carboniferous Flora."

FOR the past year, a station for solar research has been maintained on Mount Wilson, California, by the Yerkes Observatory, with the aid of a grant from the Carnegie Institution of Washington. This station has now been replaced by a new solar observatory which has been established by the Carnegie Institution, and the following staff, formerly of the Yerkes Observatory, has been appointed:—Prof. G. E. Hale (director), Prof. G. W. Ritchey, Mr. F. Ellerman, and Mr. W. S. Adams.

PROF. VALDEMAR STEIN, leader of a well known Copenhagen analytical and chemical laboratory, where for a number of years official and private tests and investigations in Denmark have taken place, died on February 1, aged 69 years. He took over in 1863 the laboratory founded by H. C. Örsted and altered it to its present shape, making it a valuable public institution. Beside his work there Stein was Government adviser in chemical agriculture, and wrote many scientific articles on chemical and agricultural subjects.

THE Imperial Academy of Sciences, St. Petersburg, at the last annual meeting, awarded the Lomonosoff prize of 100*l.* to Prof. N. A. Menschutkin for his well-known and extensive researches in the domain of theoretical chemistry. The Ivanoff prize was awarded to Prof. P. N. Lebedeff, of Moscow, for his remarkable experimental researches on the pressure of light. At the same meeting, Prof. S. Th. Oldenburg declared, in his yearly review of the work of the academy, that the Polar Committee had given up all hope of the return of Baron Edward Toll, F. G. Seeberg, and their two companions. The party was probably lost during the Arctic night while trying to cross the ice-fields lying between Bennett Island and the New Siberian archipelago.

A NATIONAL exhibition of brewing materials and products will be held in Paris during March, 1906.

AT the meeting of the French Physical Society on January 20, under the presidency of M. d'Arsonval, the following officers were elected:—Vice-president, M. Amagat; general secretary, M. Henri Abraham; treasurer, M. de la Touanne. The office of president falls on M. Dufet.

THE *Times* correspondent at Colombo states that Sir H. A. Blake, Governor of Ceylon, announced at the last meeting of the Asiatic Society that Sinhalese medical books of the sixth century described 67 varieties of mosquitoes and 424 kinds of malarial fever caused by mosquitoes.

AT the meeting of the Anthropological Institute to be held on Tuesday next, February 14, Dr. A. C. Haddon, F.R.S., will exhibit a series of kinematograph pictures of native dances from the Torres Straits, taken by him when in New Guinea. Applications for admission should be addressed to the Secretary of the Institute at 3 Hanover-square, W.

A LARGE and influential international committee has been formed in Heidelberg, under the presidency of His Excellency Dr. A. Freiherr von Dusch, Minister of Education, &c., of the Grand Duchy of Baden, with the object of honouring the memory of the late Prof. Carl Gegenbaur, who for nearly thirty years was the director of the Anatomical Institute of Heidelberg. The committee has decided upon a life-size bust of Gegenbaur, to be executed in marble by Prof. C. Seffner, Leipzig. The bust will be placed in the vestibule of the Anatomical Institute, probably in the early summer, at a date not yet fixed. The committee invites former pupils of the deceased master, and all those who have benefited from his epoch-making works on human and comparative anatomy, to send monetary contributions, with their addresses and titles, to Prof. M. Fuerbringer, or to Prof. E. Goeppert, both in Heidelberg. Every contributor will receive a picture of the bust, and casts may be obtained, on special application, from Prof. C. Seffner.

AFTER an interval of two years the fifth conference of West Indian agriculturists was held at Port-of-Spain, Trinidad, from January 4 to 13. It was attended by official, scientific, commercial, and practical representatives from all parts. In his presidential address, Sir Daniel Morris gave an interesting survey of the great economic change which is in progress. Taken in the aggregate, sugar cultivation must still be regarded as the backbone of the colonial industries, but in some of the islands it has already become of comparatively little or no importance. Trinidad is now a cacao-producing island, its exports of this commodity having risen to the value of a million sterling per annum. Grenada's cacao exports are valued at 250,000*l.*, and Jamaica's at 80,000*l.* Cotton growing, too, has been successfully re-established in several islands, and remunerative prices for the raw cotton are being obtained from Lancashire merchants. The exportations of fruit far exceed in value those of the staple industry. The development of the tobacco, rubber, sisal hemp, fish-curing, and other industries also came under review, and Sir Daniel dwelt upon the importance of agricultural shows and on the provision made by his department for teaching elementary science and the principles of agriculture in the various colleges and elementary schools. Numerous papers were read and discussed, Prof. d'Albuquerque, Dr. Watts, Prof. Harrison, and others supplying valuable information relating to sugar; Mr. Hart, Mr. de Gannes, &c., on cacao; Mr. Bovell, Mr. Sands, &c., on cotton; and so on.

For practical purposes visits were paid to several cacao and sugar estates. Owing to its more than usually representative character the conference is declared to have been the most successful of the series.

THE very high barometric readings over the British Isles during the latter part of January last are noteworthy. The weather report for the week ending January 28 issued by the Meteorological Office stated that on Wednesday (25) the eastern edge of an anticyclone had appeared over the west of Ireland; this system, moving slowly eastward, and continually increasing in intensity, covered the whole kingdom by Thursday, its maximum pressure being about 30·7 inches. It subsequently moved southward and south-westward, and continued to increase in energy until Saturday (28), when the barometer rose to 31 inches or more over the south-western parts of the United Kingdom. The highest reading was reported from Scilly, at 2h. p.m. on January 28, 31·06 inches, and appears to have been the highest on record for that part of the kingdom. Very high readings also occurred over the eastern portion of the North Atlantic. Recent cases of very high readings occurred in January, 1902, January, 1896, and January, 1882. The highest reading on record in the British Isles is 31·11 inches at Ochtertyne (Scotland), in January, 1896, and the lowest 27·33 inches at the same place, in January, 1887. It will be observed that all these extreme readings have occurred in the month of January.

WE have to acknowledge the receipt of a copy of the *Transactions* of the Hull Scientific and Field Naturalists' Club for 1904 (vol. iii. part ii.). The most important item in its contents is a list, with references, of the land and freshwater molluscs of the East Riding, drawn up by Mr. T. Petch, occupying fifty-two pages.

THE salmon and trout of Japan form the subject of an article by Mr. T. Kitahara in vol. v. part iii. of *Annotationes Zoologicae Japonensis*. In place of the nine species of these fishes admitted by Messrs. Jordan and Evermann, the author recognises only seven from Japanese waters, of which the majority belong to Oncorhynchus.

THE contents of the *Biologisches Centralblatt* for January 15 include an article on the structure of certain ants' nests, by Mr. C. Ernst, and a criticism, by Dr. C. Schröder, of Mr. C. Schaposchnikow's theory of the colouring of the hind-wing of the butterflies of the genus Catocala, to which allusion has been already made in our columns.

THE *Zoologist* commences the year well with an excellent article on budding in animals by Prof. McIntosh, of St. Andrews, in which the various forms of propagation by gemmation are described in a clear and popular manner. In the same issue appears Mr. Southwell's account of sealing and whaling for 1904. Eleven right whales were captured during the season by British vessels and at British stations; but the Americans are reported to have taken no less than forty-nine. The price demanded for sizable whalebone is 2500*l.* per ton. Fin-whale hunting is being pursued with great energy, and as the demand for the products of these whales is limited, the author suggests that the market may be glutted.

THE *Nature Study Review* is the title of a journal published in New York of which the first volume is before us. "The aims and plans of the editorial committee," it is stated in the introduction, "are based upon an interpretation of nature-study in its literal and widest sense as including all phases, physical as well as biological, of studies of natural objects and processes in elementary schools." Several eminent writers have united to give their views as to the scope and limitations of nature-study; while others have done their best to refute hostile criticism of the movement. "Faddism," the bane of the movement, is strongly deprecated. In wishing the new venture a successful career, we may take the opportunity of recording our full sympathy with the effort to make scholars actually acquainted with natural objects, instead of attempting to learn about them through books alone. But the interpretation of the movement must be a liberal one, and it must be realised that a visit to a museum is just as much nature-study as is a saunter through a country lane.

THE double number of the *American Naturalist* for November and December last contains a suggestive article by Mr. W. D. Matthew on the arboreal ancestry of mammals. Strong arguments have been brought forward during the last few years by Mr. Dollo in Belgium and by Mr. Bensley in America to show that the ancestors of marsupials were probably arboreal; and in the present communication the author seeks to show that the same holds good for mammals in general. It is urged that the mammals of the Cretaceous were all of small size and mostly of a primitive type from which both marsupials and placentals might well have been derived. These early mammals were probably arboreal; and if so, the opposable thumb and hallux of certain living types is an archaic and not an acquired feature. Support to the view as to the arboreal habits of the ancestral mammals is afforded by the Upper Cretaceous upland flora, which first permitted the existence of an extensive terrestrial land mammalian fauna. If the theory be true, it entirely upsets the old idea that arboreal mammals had taken to their distinctive mode of life to escape persecution on the ground.

WE have received a copy of an important memoir by Dr. O. Abel, published in the *Abhandlungen* of the Austrian Geological Survey (vol. xix. part ii.), on the fossil sirenians of the Mediterranean formation of Austria, into the merits of which the limitations of space do not admit of our entering so fully as we desire. The title of the memoir scarcely does justice to its contents, for although the prime object is the description of the species known as *Metaxytherium krahuletzi*, the author also describes a number of remains of the much more primitive genus Eotherium, from the Eocene of the Mokattam Range, near Cairo. The most important feature connected with the latter (if the remains be rightly identified) is the discovery that Eotherium possessed a complete pelvis, showing a well-marked obturator foramen. In this respect the genus differs from all other known members of the order, and is thus brought into connection with less specialised mammals. The three Egyptian Eocene genera Eotherium, Eosiren, and Protosiren (new) are regarded as the earliest known ancestors of the dugong group; and to these succeed Halitherium in the Oligocene, Metaxytherium in the Miocene, and Felsinotherium in the Pliocene. In seeking to illustrate the origin of the downward flexure of the muzzle of the dugong by a malformed horse skull, we think the author has been ill-advised, as there is a much simpler and more natural explanation of the feature. In connection with the memoir by Dr. Abel, we may refer to a paper on the pelvis of Steller's sea-cow (*Rhytina stelleri*) by Dr. L. von Lorenz, published in part iii. of vol. xix. of the *Abhandlungen* of the Vienna Geologisches Reichsanstalt. The description and figure of this rudimentary bone supplement Dr. Abel's account of sirenian osteology in general.

DR. STRONG, the director of the Biological Laboratory, Manila, has published a valuable experimental study of the subject of protective inoculation against Asiatic cholera (No. 16, Bureau of Government Laboratories, Manila). After detailing the various methods of producing experimentally immunity against the cholera microbe, he discusses the use of Haffkine's prophylactic, which has been extensively employed in India with encouraging results, but an objection to which is the marked reaction that follows the inoculation, causing the inoculated person to be somewhat ill for two or three days. To remove this objection, Dr. Strong has obtained a prophylactic fluid by suspending the cholera microbes obtained from agar cultures in sterile water, keeping this suspension at 60° C. for several hours, then incubating at 37° C. for three or four days, and finally filtering through a porous porcelain filter. The fluid so obtained (a product of the autolytic digestion of the cholera microbes) was found to produce a high immunity in animals against cholera, and when injected into man was found to be free from danger, and to produce practically no general or local disturbance.

IN the *Victorian Naturalist* for November, 1904, it is mentioned that, at the October meeting of the Field Naturalists' Club in Melbourne, a number of collections of wild flowers were sent from State schools in the country, including some so far away as Hawkesdale. Dimboola, and Mansfield. These were of great interest to teachers and children from the schools in Melbourne, who were allowed to take away named specimens for study. Would it not be possible to include in one of the exhibitions, such as the Grand Horticultural Exhibition held last June in the gardens of the Royal Botanic Society, similar collections from country schools for the benefit of schools in the metropolis?

IT is remarkable how many comparative experiments conducted in tropical countries, with some or all of the established rubber plants, have demonstrated the superiority of *Hevea brasiliensis*, the source of Para rubber. One of the latest accounts is that by Mr. W. H. Johnson, director of agriculture, Gold Coast, issued as one of the miscellaneous series of *Colonial Reports*. Experiments in the Botanic Gardens, Aburi, were unsuccessful with the West African vine, *Landolphia owariensis*, Ceara, *Manihot glaziovii*, Assam, *Ficus elastica*, and Central American rubber, *Castilloa elastica*; fairly satisfactory results were obtained with the indigenous *Funtumia elastica*, but Hevea excelled in quantity and quality of rubber, in its rate of growth, and has been remarkably free from insect and fungus pests.

THERE seems to be good reason to believe that exploration of the more remote parts of Eastern Asia will add very considerably to the number of botanical species already known. In vol. iv. of the *Records* of the Botanical Survey of India, Sir Joseph Hooker states that the number of species of Impatiens, the second largest genus of Indian flowering plants, recorded for India has increased from 124 to 200 in thirty years, and that many more may be expected from the less accessible districts of Burma, Nepal, and the Eastern Himalayas. In the hope of inducing forest officers or other officials in India to take up the collection, or better, the study of this genus, Sir Joseph Hooker is publishing in the *Records* an epitome of the known species, and he also directs attention to two points of interest, the anomalous structure of the flower, and the remarkable details of segregation of the species.

IT is always of interest to note a distinct novelty in the photographic line, but in the new Lambex system of daylight loading and film and plate changing, which has been introduced by Messrs. R. and J. Beck, Ltd., in a new class of cameras called the Lambex cameras, we have quite a new invention. The makers have sent us for inspection one of these cameras with the so-called Lambex skeleton and its envelope. The method of exposing is most simple and ingenious, and is one that will no doubt find considerable favour among photographers. The skeleton, less than half an inch thick, is the name of the folded strip of paper with a tag attached at each fold; in each of the folds, twelve in number, a film or plate, of any description or make, is held by a flap at the top and two corner slots at the bottom, and an opaque card is attached to the front. This skeleton is contained in a double length opaque envelope, the unexposed films remaining in the lower portion, and the exposed films being pulled one by one into the upper portion by the attached tags. The lower portion of the envelope is provided with an opening to correspond to the size of the film through which the exposure is made, and surrounding this opening is a stiff projecting edge of card into which the envelope with its skeleton is slid into a frame in the camera. The makers claim many advantages for this system, such as daylight loading, any plates or films may be used, the skeletons can be recharged, no scratching of films, no mechanism, &c. The compactness of this system renders it applicable to both folding, pocket, and box cameras, and the makers have now prepared a series of well-made Lambex cameras, constructed in several forms and sizes, and fitted with their well-known lenses. Limitations of space prevent us from entering more into detail, but the handbook of instructions in the form of a neat pocket-book contains all the necessary information.

To the February number of the *Monthly Review*, Sir William Ramsay contributes an article having the title "What is an Element?" It contains a popular account of the changes introduced into conceptions of the nature of elements owing to the discovery of the inert gases of the atmosphere and of radium and the radio-active elements.

THE remarkable power of aluminium to absorb completely the vapour of mercury even when highly diluted with air, and at the ordinary temperature, is the subject of a paper by N. Tarugi in the *Gazzetta* for January 14. This property is made the basis of an extremely delicate test for mercury, and of a preventive measure against poisoning by mercury vapour. A species of respirator has been patented in which the air that is inhaled is made to pass through a mass of finely divided aluminium; in this passage every trace of mercury is absorbed, the action being so complete that the dense vapours evolved by heated mercuric chloride may be breathed with impunity. The respirator has already been introduced with good results into the mercury mines of Monte Amiata.

A STRIKING instance of the intimate connection existing between the configuration of chemical substances and their susceptibility to fermentation is to be found in a paper by C. Ulpiani and M. Cingolani in the *Gazzetta* for January 14. The *Bacillus acidi urici*, which has the property of decomposing uric acid into carbon dioxide and urea by a process of successive hydrolysis and oxidation, is without action on the closely allied substances α-methyluric acid, guanine, caffeine, and theobromine. On the other hand the bacillus is capable of rapidly and completely oxidising such acids as tartronic, malonic, and mesoxalic acids, which contain the same carbon chain as that constituting the central axis of uric acid, whilst, in addition, the ureides of these acids, namely, barbituric acid, dialuric acid, and alloxan, are converted by the ferment quantitatively into urea and carbon dioxide. Moreover, just as in the case of the sugars only the hexoses are capable of undergoing fermentation, the bacillus of uric acid is indifferent to acids containing fewer or more than three carbon atoms.

THE *Psychological Bulletin* (vol. ii., No. 1) for January contains a notice of the meeting of the north central section of the American Psychological Association which was held at Chicago on November 26, under the presidency of Prof. W. D. Scott, of the North-western University. The following papers were read:—Is subjective idealism a necessary point of view for psychology? by Mr. Stephen S. Colvin; the genesis of meaning, by Mr. I. E. Miller; relation of sensation and revived mental processes, by Messrs. T. H. Haines and J. C. Williams; the vehicle of cognition, by Mr. B. H. Bode; psychological method, by Mr. C. A. Blanchard; an Iowa case of complete congenital cataracts cured after twenty-two years, by Mr. James Burt Miner; the relations of psychology to logic, by Miss Harriet S. Penfield; the functional theory in psychology and the concept of transcendence, by Mr. J. H. Farley; the psychology of linguistic development in the individual, by Mr. M. V. O'Shea; is the beauty of art a higher type than that of nature? by Mr. George Rebec; the reality and the symbol in education, by Miss Julia H. Gulliver; and a motor theory of rhythm, by Mr. R. H. Stretton

THE Walter Scott Publishing Company will shortly issue a translation of "Science and Hypothesis," by Prof. Poincaré. Prof. J. Larmor, Sec.R.S., has written a preface to this edition of Prof. Poincaré's work.

A COPY of the report of the librarian of the U.S. Congress for the fiscal year ending June 30, 1903, has been received from Washington. The report runs to 600 pp., and includes elaborate details concerning every department of the library's activities. A select list of recent purchases during 1901–1903 constitutes part ii. of the volume, and a third section is devoted to a report on copyright legislation.

MR. JOHN A. BERGSTRÖM, of Indiana, writing in the *Psychological Bulletin,* describes a spring suspension for laboratory motors used for driving colour mixing or other experimental apparatus, with the object of reducing the noise and vibration produced by motors resting on a fixed base.

THE third English edition of Prof. Mendeléeff's "Principles of Chemistry" has been published in two volumes by Messrs. Longmans, Green and Co. The new volumes are a translation from the seventh Russian edition by Mr. George Kamensky, edited by Mr. Thomas H. Pope. There are three appendices to the work. The first of these is the Royal Institution lecture delivered by Prof. Mendeléeff on May 31, 1889, entitled "An Attempt to apply to Chemistry one of the Principles of Newton's Natural Philosophy"; the second, on the "Periodic Law of the Chemical Elements," is Prof. Mendeléeff's 1899 Faraday lecture to the Chemical Society; the last is entitled "An Attempt towards a Chemical Conception of the Ether," and its contents were described in an article which appeared in NATURE on November 17, 1904 (vol. lxxi., No. 1829). The work is one of the classics of chemical science, and the new edition will be widely welcomed.

OUR ASTRONOMICAL COLUMN.

EPHEMERIS FOR COMET 1904 *e*.—Given below is an extract from a daily ephemeris computed by Dr. E. Strömgren from the elliptic elements calculated by M. Fayet for comet 1904 *e*.

12*h*. (*M.T. Berlin*).

1905		α			δ		log *r*	log Δ
		h.	m.	s.	°	′		
Feb. 9	...	2	29	38	... +21	14	... 0·1582	... 0·0816
,, 11	...	2	34	23	... +22	27		
,, 13	...	2	39	14	... +23	38	... 0·1613	... 0·0940
,, 15	...	2	44	10	... +24	47		
,, 17	...	2	49	12	... +25	54	... 0·1647	... 0·1067

On February 7 the comet was very near to, but southwest of, ν Arietis (*Astronomische Nachrichten*, No. 3991, supplement).

EPHEMERIS FOR COMET 1904 *d*.—The following is an extract from the daily ephemeris for comet 1904 *d* published in No. 3991 of the *Astronomische Nachrichten* by Herr M. Ebell.

12*h*. (*M.T. Berlin*).

1905	α (true)			δ (true)		log *r*	log Δ	Brightness
	h.	m.	s.	°	′			
Feb. 9 ...	19	22	32 ...	+54	50 ...	0·3492 ...	0·3584 ...	0·82
,, 13 ...	19	41	49 ...	+56	28 ...	0·3542 ...	0·3643 ...	0·78
,, 17 ...	20	1	45 ...	+57	57 ...	0·3593 ...	0·3710 ...	0·74
,, 21 ...	20	22	13 ...	+59	17 ...	0·3645 ...	0·3784 ...	0·70

Brightness at time of discovery = 1·0.

An observation made by Herr Pechüle at 16h. 24·3m. (Copenhagen M.T.) on January 14 gave corrections to this ephemeris of −4s. and −0′·5.

On February 9 the comet will be to the north-west of, and near to, κ Cygni, then, travelling in a north-easterly direction, it will pass into the constellation Cepheus.

ORBIT OF COMET 1904 *e* (BORRELLY).—From the observations made at Königsberg on December 31 and at Paris on January 11, M. Fayet has made an investigation of the probable orbit of Borrelly's comet (1904 *e*). In the first place three different sets of parabolic elements were computed, but, although the arc traversed by the comet whilst under observation was very small, and the results obtained were therefore not very trustworthy, the non-agreement of the parabolic elements with the observational results was too great to be admitted. M. Fayet therefore computed a set of elements on the assumption that the orbit was elliptical, and these were much more satisfactory, indicating a short period of about six years.

The following set of elliptic elements was finally adopted as giving a fairly satisfactory agreement between the observed and computed positions:—

$$\begin{aligned} T &= 1905 \text{ Jan. } 15{\cdot}77425 \text{ (M.T. Paris)} \\ \left.\begin{aligned} ☊ &= 76^\circ\ 6'\ 43''{\cdot}97 \\ i &= 30^\circ\ 55'\ 21''{\cdot}25 \\ \varpi &= 351^\circ\ 35'\ 27''{\cdot}11 \end{aligned}\right\} & \ 1905 \\ \log q &= 0{\cdot}149236 \\ \log e &= 9{\cdot}818195 \end{aligned}$$

These results give a value for μ of 423″·915, and therefore indicate that the comet is of the short-period type, making one revolution in its orbit in about eight years (*Comptes rendus*, No. 4, 1905).

OBSERVATIONS OF THE LEONID SHOWER OF 1904.—In a note published in No. 3989 of the *Astronomische Nachrichten,* Mr. Denning gives a few details of his observations of the late Leonid shower at Bristol.

During a watch of about one and a half hours between 13h. 30m. and 15h. 45m. on November 14, 55 meteors, of which 33 were Leonids, were seen, and Mr. Denning estimated that, at that time, the latter were appearing at the rate of about 25 per hour, for one observer, from a radiant situated at R.A. = 151°, decl. = +23°. No increase